### Dell Inc.

**PowerEdge MX750c (Intel Xeon Gold 6314U, 2.30 GHz)**

<table>
<thead>
<tr>
<th>Copies</th>
<th>SPECrate®2017_fp_base</th>
<th>SPECrate®2017_fp_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>64</td>
<td>204</td>
<td>216</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 55  
**Test Sponsor:** Dell Inc.  
**Tested by:** Dell Inc.  
**Test Date:** Apr-2021  
**Hardware Availability:** Apr-2021  
**Software Availability:** Feb-2021

#### Hardware

- **CPU Name:** Intel Xeon Gold 6314U  
- **Max MHz:** 3400  
- **Nominal:** 2300  
- **Enabled:** 32 cores, 1 chip, 2 threads/core  
- **Orderable:** 1 chip  
- **Cache L1:** 32 KB I + 48 KB D on chip per core  
- **L2:** 1.25 MB I+D on chip per core  
- **L3:** 48 MB I+D on chip per chip  
- **Other:** None

- **Memory:** 512 GB (8 x 64 GB 2Rx4 PC4-3200AA-R)  
- **Storage:** 125 GB on tmpfs  
- **Other:** None

#### Software

- **OS:** Red Hat Enterprise Linux 8.3 (Ootpa)  
  4.18.0-240.el8.x86_64  
- **Compiler:** C/C++: Version 2021.1 of Intel oneAPI DPC++/C++ Compiler Build 20201113 for Linux; Fortran: Version 2021.1 of Intel Fortran Compiler Classic Build 20201112 for Linux; C/C++: Version 2021.1 of Intel C/C++ Compiler Classic Build 20201112 for Linux

- **Parallel:** No

- **Firmware:** Version 1.1.0 released Mar-2021

- **File System:** tmpfs

- **System State:** Run level 3 (multi-user)

- **Base Pointers:** 64-bit

- **Peak Pointers:** 64-bit

- **Other:** jemalloc memory allocator V5.0.1

- **Power Management:** BIOS and OS set to prefer performance at the cost of additional power usage.
# SPEC CPU®2017 Floating Point Rate Result

## Dell Inc.

PowerEdge MX750c (Intel Xeon Gold 6314U, 2.30 GHz)

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</table>

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

## Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor. For details, please see the config file.

## Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"

## Environment Variables Notes

Environment variables set by runcpu before the start of the run:

```
LD_LIBRARY_PATH =
    "/mnt/ramdisk/cpu2017-1.1.7-ic2021.1/lib/intel64:/mnt/ramdisk/cpu2017-1.1.7-ic2021.1/jre5.0.1-64"
MALLOCONF = "retain:true"
```

## General Notes

Binaries compiled on a system with 1x Intel Core i9-7980XE CPU + 64GB RAM memory using Red Hat Enterprise Linux 8.1
### General Notes (Continued)

NA: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1) is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2) is mitigated in the system as tested and documented.

Transparent Huge Pages enabled by default
Prior to runcpu invocation
Filesystem page cache synced and cleared with:
 sync; echo 3> /proc/sys/vm/drop_caches
runcpu command invoked through numactl i.e.:
 numactl --interleave=all runcpu <etc>
jemalloc, a general purpose malloc implementation
built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5

Benchmark run from a 125 GB ramdisk created with the cmd: "mount -t tmpfs -o size=125G tmpfs /mnt/ramdisk"

### Platform Notes

**BIOS Settings:**
- Sub NUMA Cluster : 2-Way Clustering
- Virtualization Technology : Disabled

- System Profile : Custom
- CPU Power Management : Maximum Performance
- C1E : Disabled
- C States : Autonomous
- Memory Patrol Scrub : Disabled
- Energy Efficiency Policy : Performance
- CPU Interconnect Bus Link
  - Power Management : Disabled

Sysinfo program /mnt/ramdisk/cpu2017-1.1.7-ic2021.1/bin/sysinfo
Rev: r6538 of 2020-09-24 e8664e66d2d7080a9effa894d3e2f1c
running on localhost.localdomain Sun Apr  4 00:30:19 2021

SUT (System Under Test) info as seen by some common utilities.
For more information on this section, see
https://www.spec.org/cpu2017/Docs/config.html#sysinfo

From /proc/cpuinfo
- model name : Intel(R) Xeon(R) Gold 6314U CPU @ 2.30GHz

(Continued on next page)
## Platform Notes (Continued)

1  "physical id"s (chips)
64 "processors"

cores, siblings (Caution: counting these is hw and system dependent. The following excerpts from /proc/cpuinfo might not be reliable. Use with caution.)

cpu cores : 32
siblings : 64
physical 0: cores 0 1 2 3 4 5 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

From lsccpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 64
On-line CPU(s) list: 0-63
Thread(s) per core: 2
Core(s) per socket: 32
Socket(s): 1
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 106
Model name: Intel(R) Xeon(R) Gold 6314U CPU @ 2.30GHz
Stepping: 6
CPU MHz: 3026.951
BogoMIPS: 4600.00
Virtualization: VT-x
L1d cache: 48K
L1i cache: 32K
L2 cache: 1280K
L3 cache: 49152K
NUMA node0 CPU(s):
0,2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32,34,36,38,40,42,44,46,48,50,52,54,56,58,60,62
NUMA node1 CPU(s):
1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31,33,35,37,39,41,43,45,47,49,51,53,55,57,59,61,63
Flags:
  fpu  vme  de  pse  tsc  msr  pae  mce  cx8  apic  sep  mtrr  pge  mca  cmov
  pat  pse36  clflush  dts  acpi  mmx  fxsr  sse  sse2  ss  ht  tm  pbe  syscall  nx  pdpe1gb
  rdtscp  lm  constant_tsc  art  arch_perfmon  pebs  bts  rep_good  nopl  xtopology
  nonstop_tsc  cpuid
  aperf
  mtrr  pni  pclmulqdq  dtes64  monitor  ds_cpl  vmx  smx  est tm2 ssse3 sdbg fma cx16
  xtrac hv  pdccl dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_counter aes
  xsave
  avx
  f16c
  rdrand
  lahf_lm
  abm
  3dnowprefetch
  cpuid_fault
  epb
  cat_l3
  invpcid_single
  intel_pinn
  ssbd
  mba
  ibrs
  ibpb
  ibrs
  enhanced
  fsqsbse
  tsc_adjust
  bmi1
  hle
  avx2
  smep
  bmi2
  erms
  invpcid
  cqm
  rdtr_a
  avx512f
  avx512dq
  rdseed
  adx
  smap
  avx512ifma
  clflushopt
  clwb
  intel
  pt
  avx512cd
  sha
  avx512bw
  avx512vl
  xsaveopt
  xsavec
  xgetbv1
  xsaves
  cqm
  l1c
  cqm
  occup
  llc
  cqm
  mbm_total
  cqm
  mbm
  local
  split
  lock
  detect
  wbnoinvd

(Continued on next page)
<table>
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<tr>
<th>Specification</th>
<th>Value</th>
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**Platform Notes (Continued)**

dtherm ida arat pln pts avx512vbmi umip pku ospe avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnni avx512_bitalg tme avx512_vpopcntdq la57 rdpid md_clear pconfig flush_l1d arch_capabilities

```
/proc/cpuinfo cache data
 cache size : 49152 KB
```

From numactl --hardware  WARNING: a numactl 'node' might or might not correspond to a physical chip.

```
available: 2 nodes (0-1)
 node 0 cpus: 0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50
           52 54 56 58 60 62
 node 0 size: 248568 MB
 node 0 free: 230657 MB
 node 1 cpus: 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51
           53 55 57 59 61 63
 node 1 size: 249052 MB
 node 1 free: 245046 MB
 node distances:
  node 0 1
    0:  10  11
    1:  11  10
```

From `/proc/meminfo`

```
MemTotal:       527807184 kB
HugePages_Total:       0
Hugepagesize:       2048 kB
```

```
/sbin/tuned-adm active
 Current active profile: throughput-performance
```

From `/etc/*release* /
```
NAME="Red Hat Enterprise Linux"
 VERSION="8.3 (Ootpa)"
 ID="rhel"
 ID_LIKE="fedora"
 VERSION_ID="8.3"
 PLATFORM_ID="platform:el8"
 PRETTY_NAME="Red Hat Enterprise Linux 8.3 (Ootpa)"
 ANSI_COLOR="0;31"
 redhat-release: Red Hat Enterprise Linux release 8.3 (Ootpa)
 system-release: Red Hat Enterprise Linux release 8.3 (Ootpa)
 system-release-cpe: cpe:/o:redhat:enterprise_linux:8.3:ga
```

```
uname -a:
 Linux localhost.localdomain 4.18.0-240.el8.x86_64 #1 SMP Wed Sep 23 05:13:10 EDT 2020
```

(Continued on next page)
Dell Inc.
PowerEdge MX750c (Intel Xeon Gold 6314U, 2.30 GHz)

SPECraten®2017_fp_base = 204
SPECraten®2017_fp_peak = 216

CPU2017 License: 55
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

Test Date: Apr-2021
Hardware Availability: Apr-2021
Software Availability: Feb-2021

Platform Notes (Continued)

x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

CVE-2018-12207 (iTLB Multihit): Not affected
CVE-2018-3620 (L1 Terminal Fault): Not affected
Microarchitectural Data Sampling: Not affected
CVE-2017-5754 (Meltdown): Not affected
CVE-2018-3639 (Speculative Store Bypass):
  Mitigation: Speculative Store Bypass disabled via prctl and seccomp
CVE-2017-5753 (Spectre variant 1):
  Mitigation: usercopy/swapgs barriers and __user pointer sanitization
CVE-2017-5715 (Spectre variant 2):
  Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling
CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected
CVE-2019-11135 (TSX Asynchronous Abort): Not affected

run-level 3 Apr 3 19:15 last=5

SPEC is set to: /mnt/ramdisk/cpu2017-1.1.7-ic2021.1

Filesystem     Type   Size  Used Avail Use% Mounted on
tmpfs          tmpfs  125G   33G   93G  26% /mnt/ramdisk

From /sys/devices/virtual/dmi/id
Vendor:         Dell Inc.
Product:        PowerEdge MX750c
Product Family: PowerEdge
Serial:         1234567

Additional information from dmidecode follows. WARNING: Use caution when you interpret this section. The 'dmidecode' program reads system data which is "intended to allow hardware to be accurately determined", but the intent may not be met, as there are frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.

Memory:
  8x 00AD063200AD HMAA8GR7AJR4N-XN 64 GB 2 rank 3200
  24x Not Specified Not Specified

BIOS:
  BIOS Vendor:    Dell Inc.
  BIOS Version:   1.1.0
  BIOS Date:      03/25/2021
  BIOS Revision:  1.1

(End of data from sysinfo program)
Dell Inc.  
PowerEdge MX750c (Intel Xeon Gold 6314U, 2.30 GHz)  

Compiler Version Notes

C  
| 519.lbm_r(base, peak) 538.imagick_r(base, peak)  
| 544.nab_r(base, peak)

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, 
Version 2021.1 Build 20201113 
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

C++  
| 508.namd_r(base, peak) 510.parest_r(base, peak)

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, 
Version 2021.1 Build 20201113 
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C++, C  
| 511.povray_r(peak)

Intel(R) C++ Intel(R) 64 Compiler Classic for applications running on 
Intel(R) 64, Version 2021.1 Build 20201112_000000 
Copyright (C) 1985-2020 Intel Corporation. All rights reserved. 

C++, C  
| 511.povray_r(base) 526.blender_r(base, peak)

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### Compiler Version Notes (Continued)

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Dell Inc. | PowerEdge MX750c (Intel Xeon Gold 6314U, 2.30 GHz) | Dell Inc.

CPU2017 License: 55 | Test Date: Apr-2021
Test Sponsor: Dell Inc. | Hardware Availability: Apr-2021
Tested by: Dell Inc. | Software Availability: Feb-2021

**Compiler Version Notes (Continued)**

```
Fortran, C    | 521.wrf_r(base) 527.cam4_r(base, peak)
```

```
Intel(R) Fortran Intel(R) 64 Compiler Classic for applications running on
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Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
```

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Fortran, C    | 521.wrf_r(peak)
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```
Intel(R) Fortran Intel(R) 64 Compiler Classic for applications running on
Intel(R) 64, Version 2021.1 Build 20201112_000000
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
```

```
Base Compiler Invocation
```

C benchmarks:
  icx

C++ benchmarks:
  icp

Fortran benchmarks:
  ifort
**Dell Inc.**

PowerEdge MX750c (Intel Xeon Gold 6314U, 2.30 GHz)  

| CPU2017 License: 55            | Specrate\textsuperscript{\textregistered}2017\textsubscript{fp\_base} = 204 |
| Test Sponsor: Dell Inc.        | Specrate\textsuperscript{\textregistered}2017\textsubscript{fp\_peak} = 216 |
| Tested by: Dell Inc.           |                             |

**Base Compiler Invocation (Continued)**

- Benchmarks using both Fortran and C:
  - ifort icx

- Benchmarks using both C and C++:
  - icpx icx

- Benchmarks using Fortran, C, and C++:
  - icpx icx ifort

**Base Portability Flags**

- 503.bwaves\_r: -DSPEC\_LP64
- 507.cactuBSSN\_r: -DSPEC\_LP64
- 508.namd\_r: -DSPEC\_LP64
- 510.parest\_r: -DSPEC\_LP64
- 511.povray\_r: -DSPEC\_LP64
- 519.lbm\_r: -DSPEC\_LP64
- 521.wrf\_r: -DSPEC\_LP64 -DSPEC\_CASE\_FLAG -convert big_endian
- 526.blender\_r: -DSPEC\_LP64 -DSPEC\_LP64 -DSPEC\_CASE\_FLAG
- 538.imagick\_r: -DSPEC\_LP64
- 544.nab\_r: -DSPEC\_LP64
- 549.fotonik3d\_r: -DSPEC\_LP64
- 554.roms\_r: -DSPEC\_LP64

**Base Optimization Flags**

**C benchmarks:**
- -w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
- -flto -mfpmath=sse -funroll-loops -gopt-mem-layout-trans=4
- -mbranches-within-32B-boundaries -ljemalloc
- -L/usr/local/jemalloc64-5.0.1/lib

**C++ benchmarks:**
- -w -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math -flto
- -mfpmath=sse -funroll-loops -gopt-mem-layout-trans=4
- -mbranches-within-32B-boundaries -ljemalloc
- -L/usr/local/jemalloc64-5.0.1/lib

**Fortran benchmarks:**
- -w -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ipo -no-prec-div
- -gopt-prefetch -ffinite-math-only

(Continued on next page)
SPEC CPU®2017 Floating Point Rate Result

Dell Inc.

PowerEdge MX750c (Intel Xeon Gold 6314U, 2.30 GHz)

| SPECrate®2017_fp_base = 204 |
| SPECrate®2017_fp_peak = 216 |

CPU2017 License: 55
Test Sponsor: Dell Inc.
Tested by: Dell Inc.
Test Date: Apr-2021
Hardware Availability: Apr-2021
Software Availability: Feb-2021

Base Optimization Flags (Continued)

Fortran benchmarks (continued):
-qopt-multiple-gather-scatter-by-shuffles -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte -auto
-mbranches-within-32B-boundaries -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

Benchmarks using both Fortran and C:
-w -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
-fflto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -O3 -ipo
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-multiple-gather-scatter-by-shuffles
-mbranches-within-32B-boundaries -nostandard-realloc-lhs
-align array32byte -auto -ljemalloc -L/usr/local/jemalloc64-5.0.1/lib

Benchmarks using both C and C++:
-w -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
-fflto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-mbranches-within-32B-boundaries -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

Benchmarks using Fortran, C, and C++:
-w -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
-fflto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-multiple-gather-scatter-by-shuffles
-mbranches-within-32B-boundaries -nostandard-realloc-lhs
-align array32byte -auto -ljemalloc -L/usr/local/jemalloc64-5.0.1/lib

Peak Compiler Invocation

C benchmarks:
icx

C++ benchmarks:
icpx

Fortran benchmarks:
ifort

Benchmarks using both Fortran and C:
521.wrf_r:ifort icc

(Continued on next page)
Dell Inc.
PowerEdge MX750c (Intel Xeon Gold 6314U, 2.30 GHz)

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Peak Compiler Invocation (Continued)

527.cam4_r: ifort icx
Benchmarks using both C and C++:
511.povray_r: icpc icc
526.blender_r: icpx icx
Benchmarks using Fortran, C, and C++:
icpx icx ifort

Peak Portability Flags
Same as Base Portability Flags

Peak Optimization Flags
C benchmarks:
519.lbm_r: basepeak = yes
538.imagick_r: basepeak = yes
544.nab_r: -w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -flto
-Ofast -qopt-mem-layout-trans=4
-fimf-accuracy-bits=14:sqrt
-mbranches-within-32B-boundaries -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

C++ benchmarks:
508.namd_r: basepeak = yes
510.parest_r: -w -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -mbranches-within-32B-boundaries
-ljemalloc -L/usr/local/jemalloc64-5.0.1/lib

Fortran benchmarks:
503.bwaves_r: -w -m64 -Wl,-z,muldefs -xCORE-AVX512 -03 -ipo
-no-prec-div -qopt-prefetch -ffinite-math-only

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# SPEC CPU®2017 Floating Point Rate Result

**Dell Inc.**

PowerEdge MX750c (Intel Xeon Gold 6314U, 2.30 GHz)

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### Peak Optimization Flags (Continued)

503.bwaves_r (continued):
- `-qopt-multiple-gather-scatter-by-shuffles`
- `-qopt-mem-layout-trans=4 -nostandard-realloc-lhs`
- `-align array32byte -auto -mbranches-within-32B-boundaries`
- `-ljemalloc -L/usr/local/jemalloc64-5.0.1/lib`

549.fotonik3d_r: `basepeak = yes`

554.roms_r: `Same as 503.bwaves_r`

Benchmarks using both Fortran and C:

521.wrf_r: `-prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX512 -O3 -ipo -no-prec-div -qopt-prefetch -ffinite-math-only`
- `-qopt-multiple-gather-scatter-by-shuffles`
- `-qopt-mem-layout-trans=4 -mbranches-within-32B-boundaries`
- `-nostandard-realloc-lhs -align array32byte -auto`
- `-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc`

527.cam4_r: `basepeak = yes`

Benchmarks using both C and C++:

511.povray_r: `-prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX512 -O3 -ipo -no-prec-div -qopt-prefetch -ffinite-math-only`
- `-qopt-multiple-gather-scatter-by-shuffles`
- `-qopt-mem-layout-trans=4 -mbranches-within-32B-boundaries`
- `-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc`

526.blender_r: `basepeak = yes`

Benchmarks using Fortran, C, and C++:

507.cactuBSSN_r: `basepeak = yes`

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The flags files that were used to format this result can be browsed at:


You can also download the XML flags sources by saving the following links:

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